FLOOD PLAIN MANAGEMENT STUDY

VILLAGE OF DALLAS
BARRON COUNTY, WISCONSIN

PREPARED BY THE

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

MADISON, WISCONSIN

IN COOPERATION WITH

BARRON COUNTY, WISCONSIN

AND THE

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

DECEMBER 1983

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Appendices

Village of Dallas Flood Plain Management Study

Introduction

The purpose of this study is to define the flood characteristics of Upper Pine Creek in the Village of Dallas. The Village of Dallas requested the study through the Barron County, and the River Country Resource Conservation and Development Area, and the Wisconsin Department of Natural Resources (DNR). The information acquired will enable them to develop an effective flood plain management program.

This report is prepared for use by the local people in planning the use and regulation of the Upper Pine Creek flood plain in the Village of Dallas.

The 100-year and 500-year flood plains have been delineated. The high water elevations and flood plains are based on 5-year projected land use of the watershed, stream, flood plain, and existing road crossings.

The Soil Conservation Service carries out flood hazard studies in accordance with Federal Level Recommendation 3 of "A Unified National Program for Flood Plain Management," and Section 6 of Public Law 83-566. The principles contained in Executive Order 11988, Flood Plain Management, are addressed in this part.

In Wisconsin the Soil Conservation Service coordinates flood plain management studies with the Wisconsin DNR, through a joint coordination agreement entered into in October 1978. The Wisconsin Water Resources Act (Chapter 614, Laws of Wisconsin, 1965) authorizes the DNR, Division of Enforcement, to establish and upgrade minimum standards for flood plain regulations.

Study Area Description

The study area is located within the Village of Dallas, in central Wisconsin. This area consists of the flood plain that lies adjacent to approximately 1.75 miles of Upper Pine Creek (see attached vicinity map). The downstream limit of the study is the village limits below the sewage treatment plant. The upstream limit is the upper end of the flowage or northern boundary of Section 14. The drainage area at the downstream limit is 19.7 square miles. The drainage area at the lower end of the flowage is 19.2 square miles. Upper Pine Creek is in USGS Hydrologic Unit 07050007.

The climate is typically continental. January temperatures average 11.4° F. July, the warmest month, has an average temperature of 70.9° F. Precipitation averages 30.5 inches per year.

The soils of the watershed consist of the Chetek-Onamia-Omega Association which are well drained to excessively drained soils, shallow to moderately deep over sand and gravel on outwash plains.

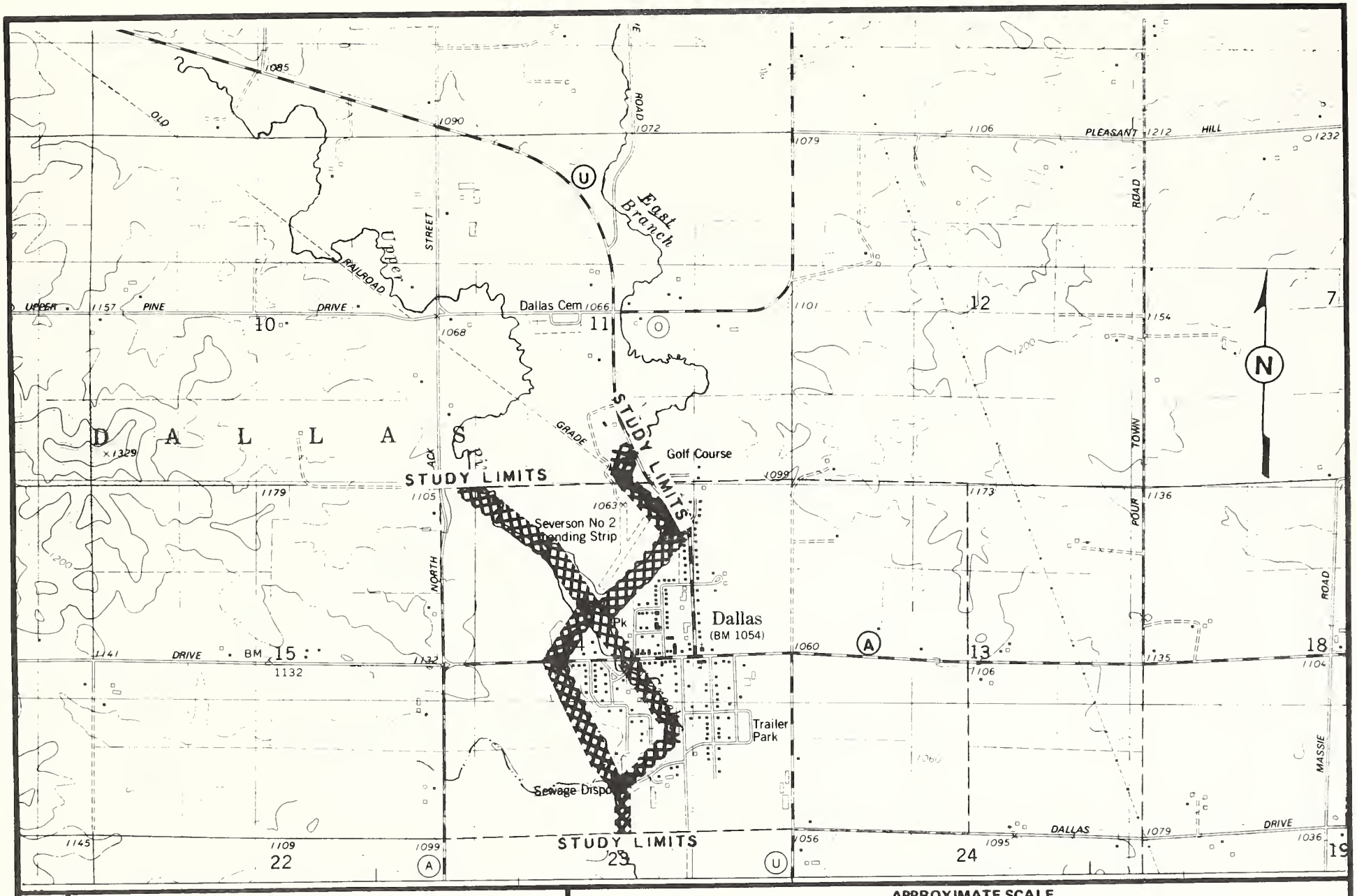


FIGURE 1

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERSERVATION SERVICE

VILLAGE OF DALLAS
FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

APPROXIMATE SCALE

2000 0 2000 4000 6000 FEET

VICINITY MAP

Natural and Beneficial Flood Plain Values

A large portion of the study area consists of the Dallas Flowage, a 27-acre manmade impoundment with a maximum depth of nine feet. The Dallas Flowage is not a game fish reproductive lake. It is, however, stocked each year and provides a fishing opportunity for local residents. The village park provides a picnic area, public access, and swimming.

The flowage is used by waterfowl, particularly during the migration season. Most of the area surrounding the flowage that is not in residential or park use is under cultivation.

Good wildlife habitat is present in the flood plain above and below the flowage along Upper Pine Creek. The dense, tag alder stream corridors provide habitat for muskrat, mink, and other small mammals as well as for numerous songbirds.

Flooding Problems

Flood damage has occurred frequently in the Village of Dallas but there is little documentation readily available. In April 1936 a reported ice jam spread 12 inches of floodwater over Main Street. A 3 1/2 to 4 inch rainfall in 4 to 5 hours on April 30, 1975 caused 8 to 10 inches of floodwater over Main Street.

Existing Flood Plain Management

Dallas does not have a flood plain zoning ordinance primarily due to the lack of adequate mapping. They are in the emergency flood insurance program and have a flood hazard map.

At present there is no specific operational plan for adjusting water levels through the dam during heavy flood flows.

Alternatives for Mitigating Flood Damages to Existing and Future Development

A. Incorporate a comprehensive flood hazard analysis into the village zoning ordinance, delineating flood plain and flood fringe. This will provide standards for all development in the flood fringe and should restrict development in the floodway of Upper Pine Creek to minimize adverse impact on life, health, and property.

B. Apply existing standards set forth in the village's subdivision control ordinance to regulate development in nonsuitable areas and minimize erosion and diffused surface water runoff within the watershed.

C. Establish conservancy districts for those areas highly conducive to erosion and unsuitable for development.

D. Relocate homes in the floodway and flood proof those existing homes in the flood fringe by elevating, filling basements, and providing dry land access during floods.

E. Modify and improve stream channel and bridge and culvert capacity throughout the watershed or construct levees and dikes to confine the 100-year flood flows within the stream channel. This alternative may have high installation and maintenance costs which should be thoroughly evaluated.

F. Apply a comprehensive upland treatment program in the upper watershed area as suggested in the RC&D measure plan of Upper Pine Creek, Barron County, Wisconsin.

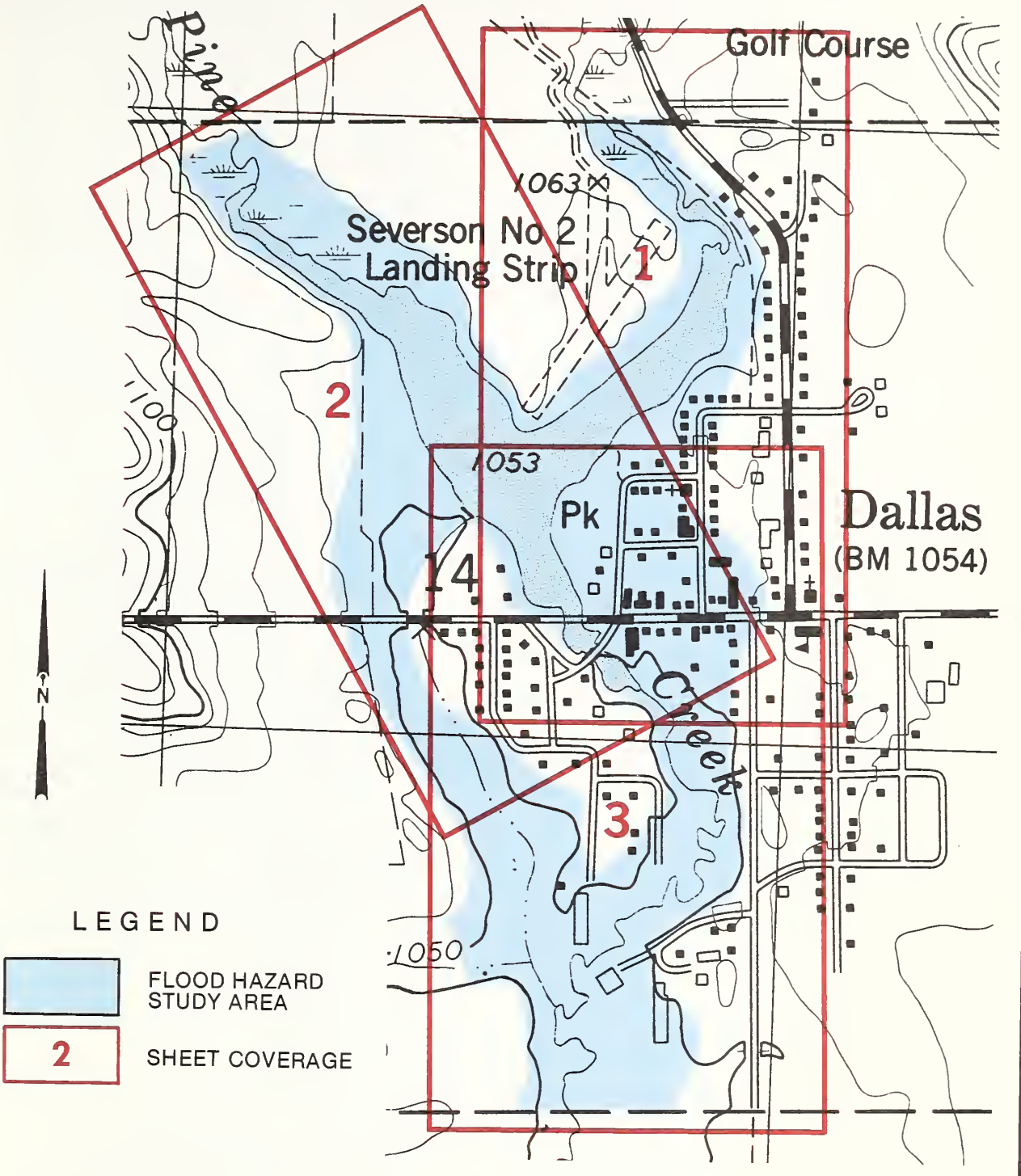
G. Thoroughly evaluate the cost to repair, replace, or remove the dam as the maintenance costs are increasingly higher each year. These will be evaluated in an RC&D study as an alternative of the measure plan.

Appendix A

Floodway and Flood Boundary Maps

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



LEGEND

FLOOD HAZARD STUDY AREA

2 SHEET COVERAGE

WISCONSIN

PHOTOMAP INDEX
VILLAGE OF DALLAS
UPPER PINE CREEK AND EAST BRANCH

BARRON COUNTY, WISCONSIN

SCALE 0 800 1600 FEET

0 200 400 METERS

APPROXIMATE

SOURCE: USGS QUADS

OCTOBER 1983 4 R-38398

USDA-SCS-FORT WORTH, TEXAS 1983

LEGEND

- Floodway
- 100 Year Flood Hazard Area
- 500 Year Flood Hazard Area
- Cross Section Location
- RM Reference Mark

State of Wisconsin
Aerial Photography
7-29-79 (3212 W13)

SCALE 0 200 400 FEET
0 50 100 METERS
APPROXIMATE

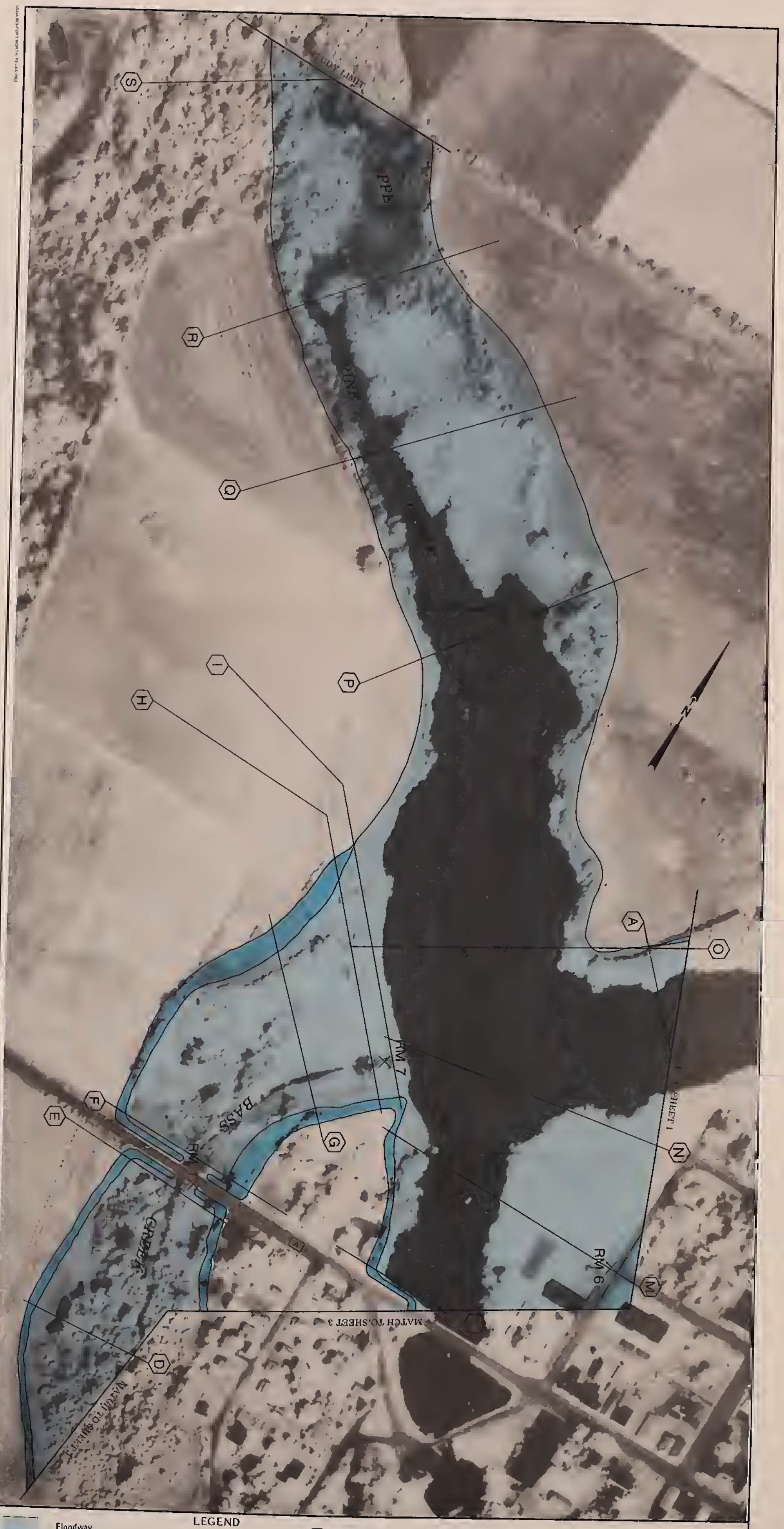
US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF OALLAS
FLOOD HAZARD STUDY
BARRON CO., WISCONSIN

SHEET 1 OF 3

EAST BRANCH

VILLAGE OF OALLAS

4 R-38398



LEGEND

- Floodway
- 100 Year Flood Hazard Area
- 500 Year Flood Hazard Area
- Cross Section Location
- RM Reference Mark

State of Wisconsin
Aerial Photography
7-29-79 (3212 W13)

SCALE 0 200 400 FEET
0 50 100 METERS
APPROXIMATE

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF DALLAS
FLOOD HAZARD STUDY
BARRON CO., WISCONSIN

SHEET 2 OF 3

UPPER PINE CREEK

VILLAGE OF DALLAS

4 R-38398

LEGEND

- Floodway
- 100 Year Flood Hazard Area
- 500 Year Flood Hazard Area
- Cross Section Location
- RM Reference Mark

State of Wisconsin
Aerial Photography
7-29-79 (3212 W13)

SCALE 0 200 400 FEET
0 50 100 METERS
APPROXIMATE

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF DALLAS
FLOOD HAZARD STUDY
BARRON CO., WISCONSIN

SHEET 3 OF 3

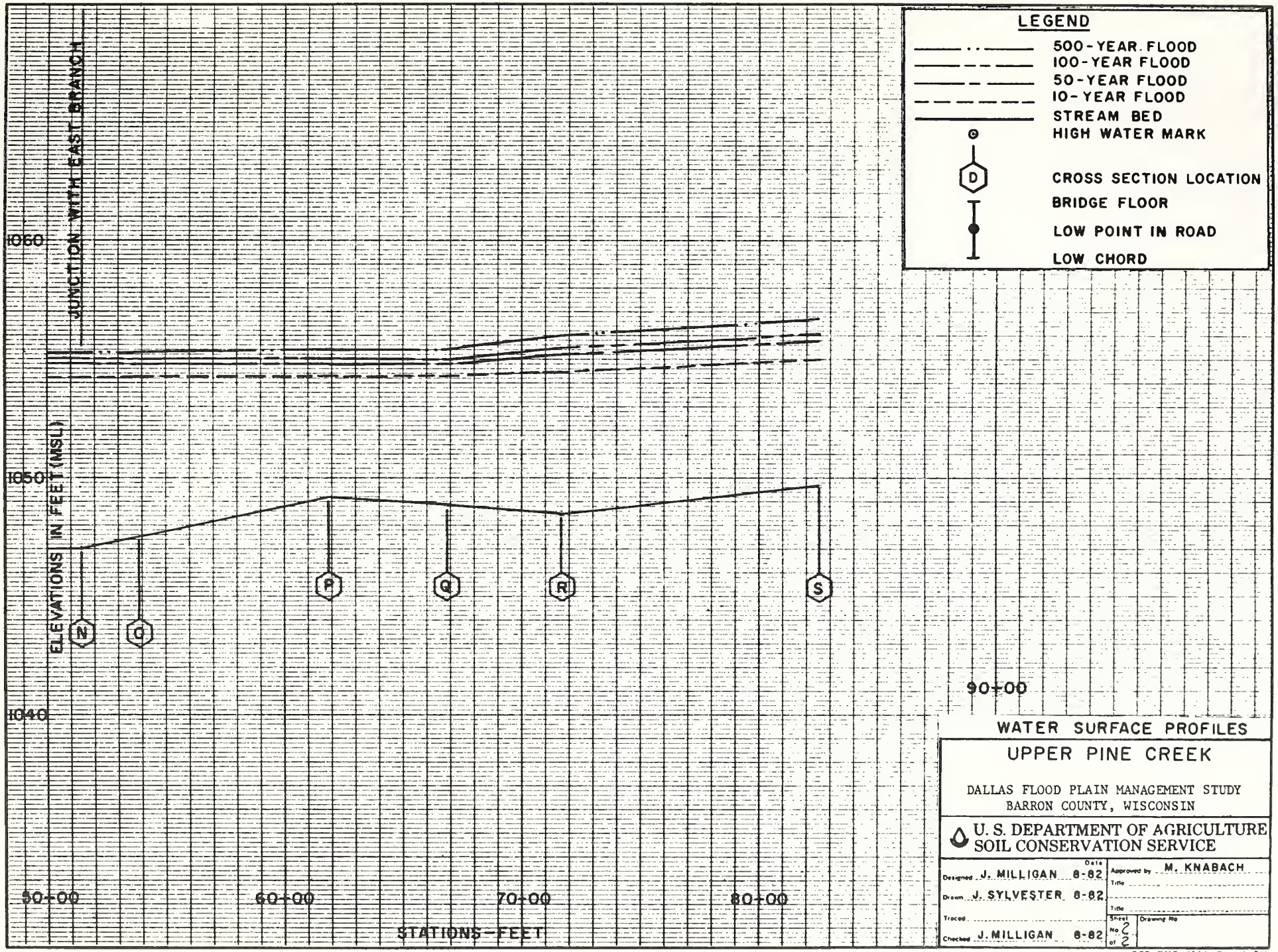
UPPER PINE CREEK

VILLAGE OF DALLAS

4 R-33398

Appendix B

Flood Profiles



B-2

WATER SURFACE PROFILES

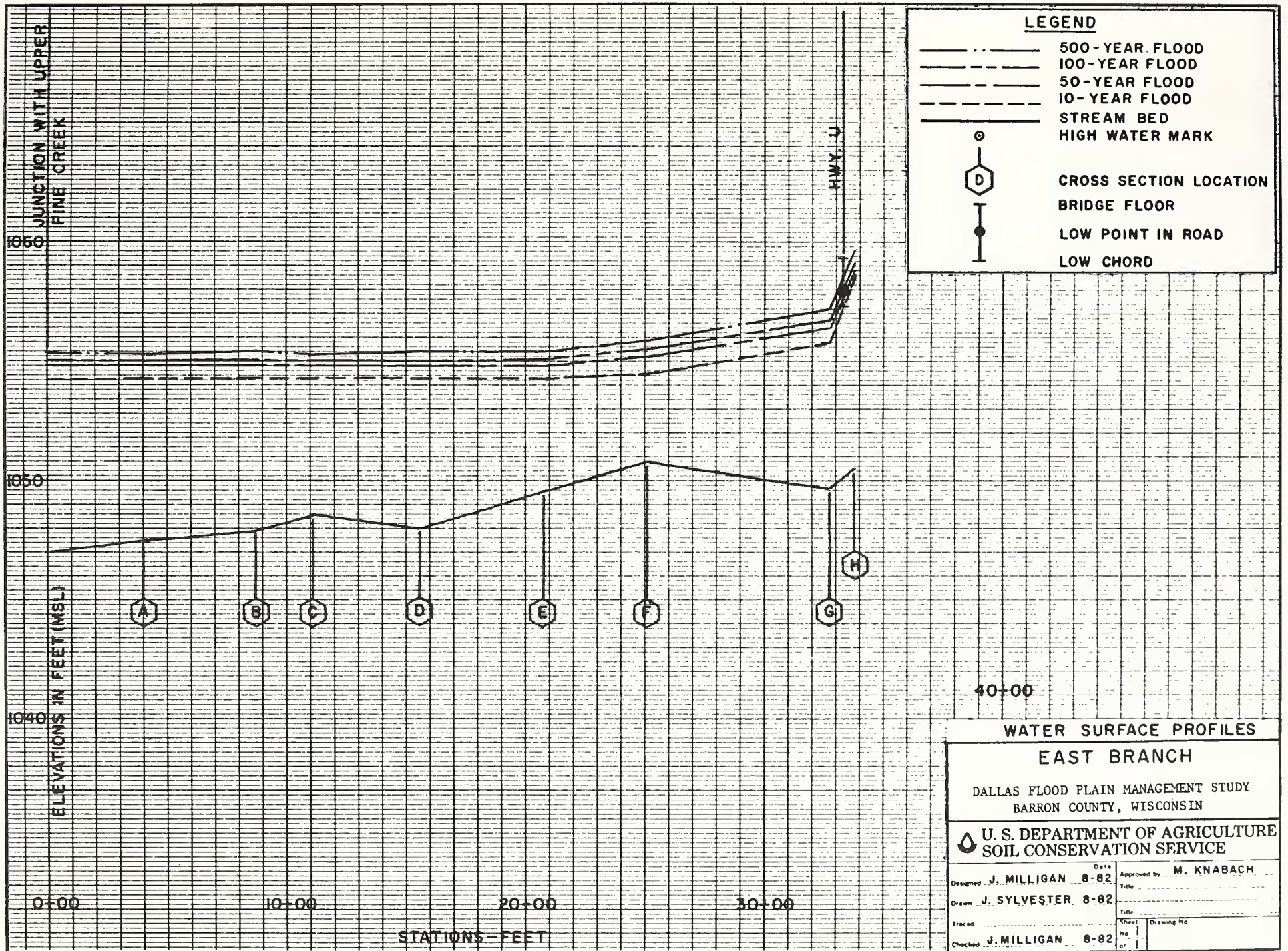
UPPER PINE CREEK

DALLAS FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed J. MILLIGAN	Date 8-82	Approved by M. KNABACH	
Drawn J. SYLVESTER	8-82	Title	
Traced		Title	
Checked J. MILLIGAN	8-82	Sheet No. 22 of	Drawing No.

SCS-ENG-316A (Rev. 1-76)



WATER SURFACE PROFILES

EAST BRANCH

DALLAS FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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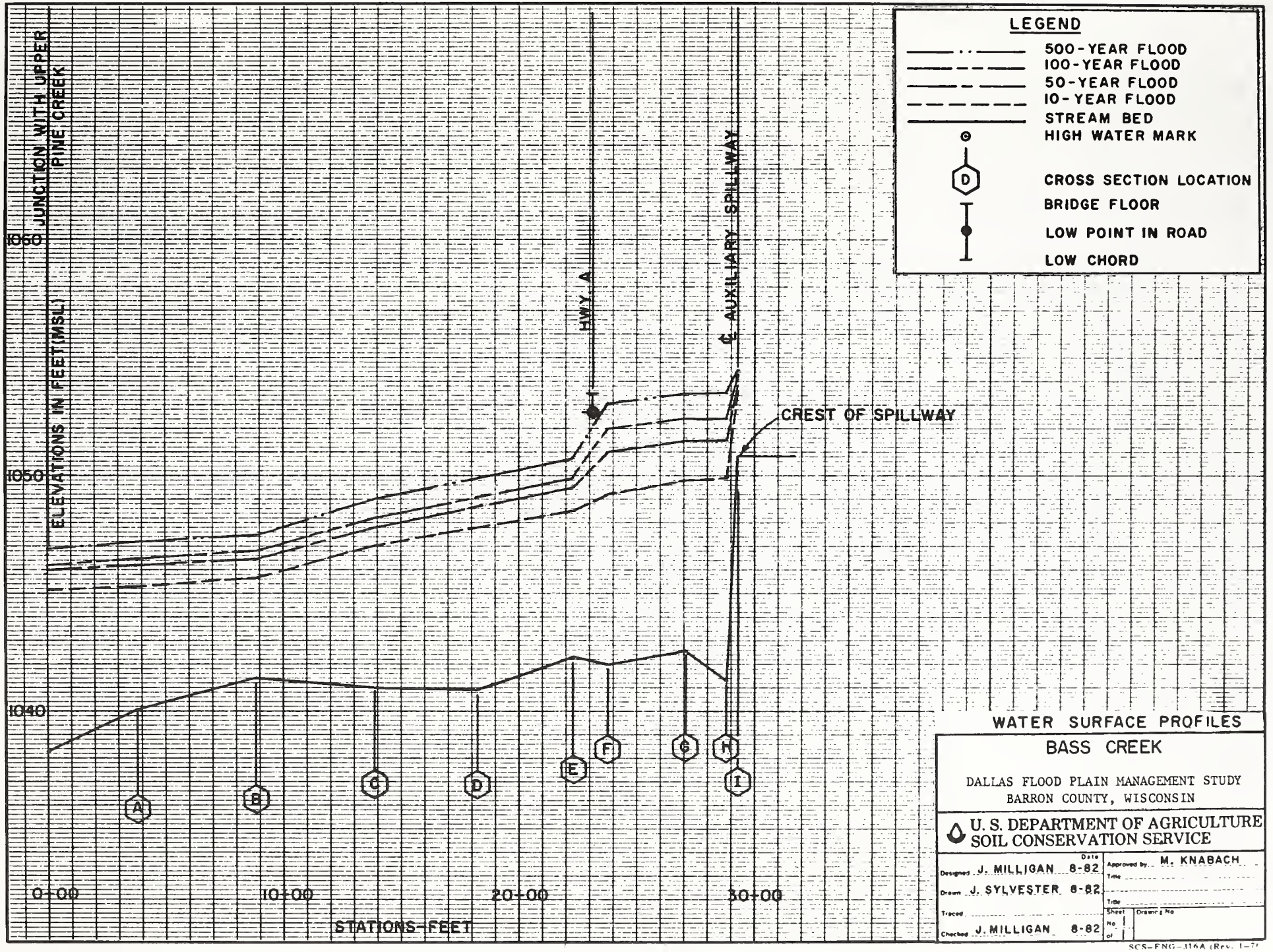

WATER SURFACE PROFILES

BASS CREEK

DALLAS FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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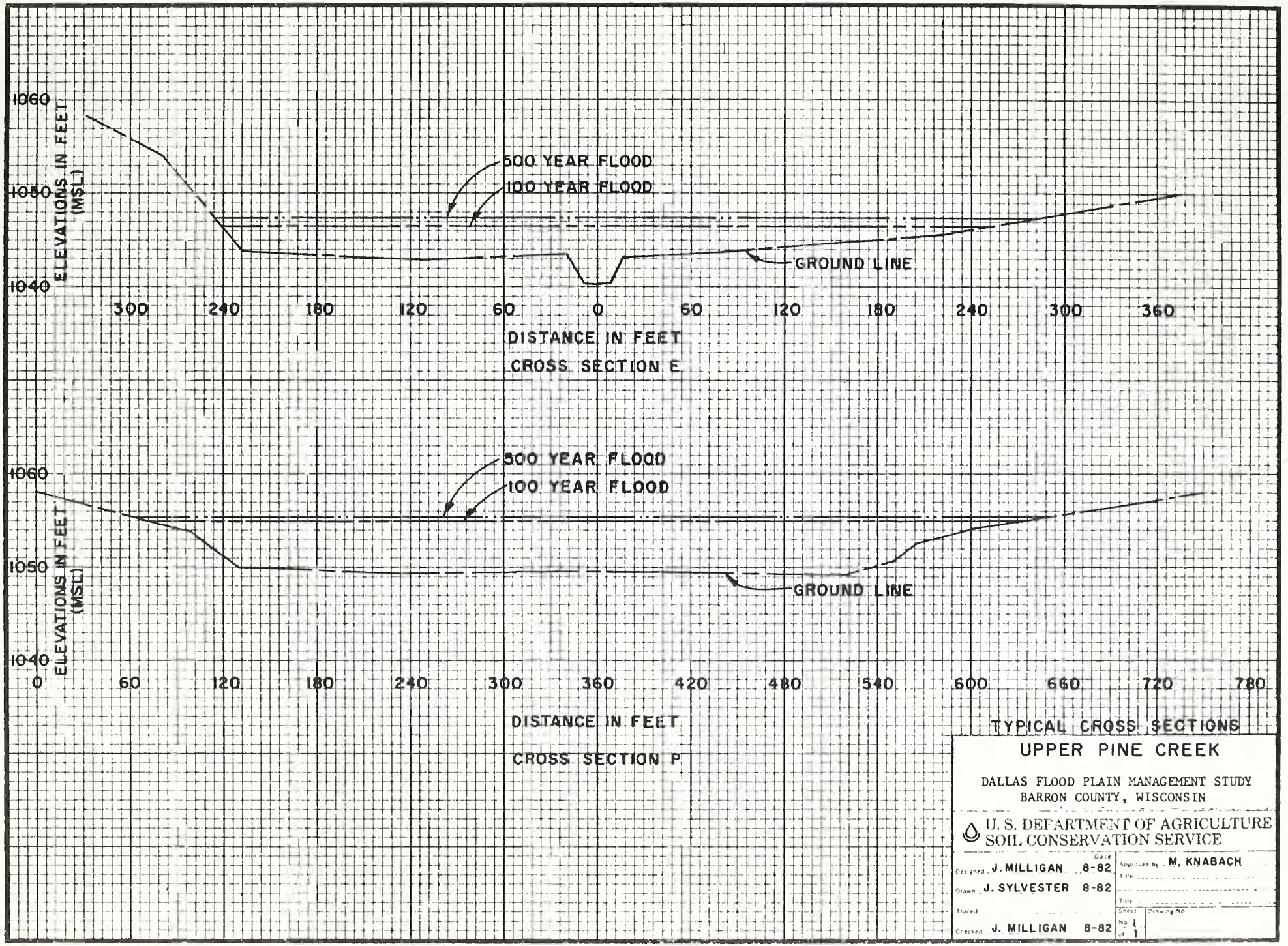
SCS-ENG-116A (Rev. 1-7

Appendix C

Typical Sections



TYPICAL CROSS SECTIONS

UPPER PINE CREEK

DALLAS FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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C-1

Appendix D

List of Bench Marks

Elevation Reference Marks
Village of Dallas

Reference Mark	Elev. (MSL)	Description
1	1053.94	USGS - Bronze tablet on top southeast corner bridge abutment on the most westerly bridge on Highway A (Dallas Street).
2	1057.19	TBM #2 - Top northeast corner bridge abutment on Highway A (Dallas Street) over Dallas Flowage.
3	1055.87	TBM #3 - Top of fire hydrant at the intersection of Dallas Street and First Avenue.
4	1052.16	TBM #4 - Top of manhole located at the corner of Hood Street and Hardman Avenue.
5	1046.11	TBM #5 - Nail in power pole #2FF55 next to the sewage treatment plant.
6	1056.11	TBM #6 - Top of fire hydrant at the corner of Anderson Street and First Avenue.
7	1051.19	TBM #7 - Top, upstream edge, and center of concrete of auxiliary spillway.
8	1058.71	TBM #8 - Nail in top of southeast wingwall on bridge on Highway "U".

Appendix E

TABULATION OF
WATER SURFACE ELEVATIONS
DISCHARGES
AND
FLOODWAY DATA

Flooding Source		Discharge - Elevation							
Cross-section	Distance 1/	10 year		50 year		100 year		500 year	
Upper Pine Creek		Q CFS	Elev. MSL	Q CFS	Elev. MSL	Q CFS	Elev. MSL	Q CFS	Elev. MSL
A	0	2680	1044.1	4288	1045.1	5226	1045.5	6700	1046.2
B	320	2680	1044.6	4288	1045.6	5225	1045.5	6700	1046.2
C	820	2680	1045.1	4288	1046.1	5226	1046.6	6700	1047.2
D	1305	1200	1045.3	1700	1046.3	1992	1046.7	2400	1047.4
E	2065	1200	1045.7	1700	1046.6	1992	1047.0	2400	1047.6
F	3165	1200	1046.4	1700	1047.1	1992	1047.5	2400	1048.1
G	3540	1200	1046.5	1700	1047.3	1992	1047.6	2400	1048.2
H	3840	1200	1046.6	1700	1047.4	1992	1047.7	2400	1048.2
I	2980	1200	1046.7	1700	1047.5	1992	1047.8	2400	1048.4
	4080	Mill Dam							
J	4120	1200	1054.2	1700	1054.7	1992	1054.9	2400	1055.2
K	4300	1200	1054.2	1700	1054.7	1992	1054.9	2400	1055.2
	4345	Country Trunk Highway A							
L	4390	1200	1054.5	1700	1055.1	1992	1055.3	2400	1055.6
M	4770	1200	1054.5	1700	1055.1	1992	1055.3	2400	1055.6
N	5145	2721	1054.5	4412	1055.1	5368	1055.3	7354	1055.6
O	5390	1317	1054.5	2136	1055.1	2599	1055.4	3560	1055.6
P	6190	1317	1054.5	2136	1055.1	2599	1055.4	3560	1055.6
Q	6690	1317	1054.5	2136	1055.1	2599	1055.4	3560	1055.6
R	7170	1317	1054.7	2136	1055.4	2599	1055.7	3560	1056.1
S	8250	1317	1055.1	2136	1056.0	2599	1056.3	2560	1056.9

1/ Distance in feet from study limits.

TABLE 1

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF DALLAS
FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

DISCHARGE - ELEVATION DATA

UPPER PINE CREEK

Flooding Source		Discharge - Elevation							
Cross-section	Distance 1/	10 year		50 year		100 year		500 year	
East Branch		Q CFS	Elev. MSL	Q CFS	Elev. MSL	Q CFS	Elev. MSL	Q CFS	Elev. MSL
A	400	1404	1054.5	2276	1055.1	2770	1055.4	3794	1055.6
B	870	1404	1054.5	2276	1055.1	2770	1055.4	3794	1055.6
C	1110	1404	1054.5	2276	1055.1	2770	1055.4	3794	1055.6
D	1555	1404	1054.5	2276	1055.1	2770	1055.4	3794	1055.7
E	2075	1404	1054.5	2276	1055.1	2770	1055.4	2794	1055.7
F	2505	1404	1054.7	2276	1055.4	2770	1055.7	3794	1056.1

1/ Distance in feet from the confluence of Upper Pine Creek and East Branch.

TABLE 1

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF DALLAS
FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

DISCHARGE - ELEVATION DATA

EAST BRANCH OF UPPER PINE CREEK

Flooding Source		Discharge - Elevation							
Cross-section	Distance 1/	10 year		50 year		100 year		500 year	
		Q CFS	Elev. MSL	Q CFS	Elev. MSL	Q CFS	Elev. MSL	Q CFS	Elev. MSL
By-pass Channel									
A	380	1591	1045.3	2580	1046.3	3139	1046.8	4300	1047.4
B	890	1591	1045.7	2580	1046.6	3139	1047.1	4300	1048.8
C	1390	1591	1047.0	2580	1047.9	3139	1048.4	4300	1049.0
D	1825	1591	1047.8	2580	1048.7	3139	1049.2	4300	1049.9
E	2230	1591	1048.5	2580	1049.5	3139	1050.0	4300	1050.7
	2305	County Trunk Highway A							
F	2380	1591	1049.2	2580	1051.0	3139	1052.0	4300	1053.0
G	2705	1591	1049.8	2580	1051.5	3139	1052.4	4300	1053.5
H	2885	1591	1049.9	2580	1051.5	3139	1052.4	4300	1053.5
I	2925	1591	1053.9	2580	1054.1	3139	1054.3	4300	1054.5

1/ Distance in feet from the confluence of the Upper Pine Creek and by-pass channel.

TABLE 1

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF DALLAS
FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

DISCHARGE - ELEVATION DATA

BASS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (M.S.L.)	WITHOUT FLOODWAY (M.S.L.)	DIFFERENCE (FT.)
Upper Pine Creek							
A	0	732	2676	1.95	1045.5	1045.5	0
B	320	740	2686	1.95	1046.1	1046.1	0
C	820	622	2767	1.89	1046.6	1046.6	0
D	1305	395	1220	1.63	1046.7	1046.7	0
E	2065	513	1575	1.26	1047.0	1047.0	0
F	3165	280	964	2.07	1047.5	1047.5	0
G	3540	320	1200	1.63	1047.6	1047.6	0
H	3840	158	731	2.72	1047.7	1047.7	0
I	3980	218	1938	1.03	1047.8	1047.8	0
J	4120	360	2082	0.96	1054.9	1054.9	0
K	4300	454	2434	0.82	1054.9	1054.9	0
L	4390	574	2967	0.67	1055.3	1055.3	0
M	4770	669	2866	0.70	1055.3	1055.3	0
N	5145	850	4165	1.29	1055.3	1055.3	0
O	5390	542	3678	0.71	1055.4	1055.4	0
P	6190	587	2741	0.95	1055.4	1055.4	0
Q	6690	492	2278	1.14	1055.4	1055.4	0
R	7170	440	1720	1.51	1055.7	1055.7	0
S	8250	452	1864	1.39	1056.3	1056.3	0

TABLE 2

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF DALLAS
FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

FLOODWAY DATA

UPPER PINE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (M.S.L.)	WITHOUT FLOODWAY (M.S.L.)	DIFFERENCE (FT.)
East Branch Upper Pine Creek							
A	400	537	2634	1.05	1055.4	1055.4	0
B	870	613	2489	1.11	1055.4	1055.4	0
C	1110	501	2237	1.24	1055.4	1055.4	0
D	1555	511	2075	1.34	1055.4	1055.4	0
E	2075	234	1106	2.50	1055.4	1055.4	0
F	2505	458	1513	1.83	1055.7	1055.7	0

TABLE 2

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF DALLAS
FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

FLOODWAY DATA

UPPER PINE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (M.S.L.)	WITHOUT FLOODWAY (M.S.L.)	DIFFERENCE (FT.)
Bass Creek							
A	380	433	1543	2.03	1046.8	1046.8	0
B	890	577	1735	1.81	1047.1	1047.1	0
C	1390	345	1214	2.59	1048.4	1048.4	0
D	1825	384	1432	2.19	1049.2	1049.2	0
E	2230	274	691	4.54	1050.0	1050.0	0
F	2380	292	1391	2.26	1052.0	1052.0	0
G	2705	379	1773	1.77	1052.4	1052.4	0
H	2885	549	1741	1.80	1052.4	1052.4	0
I	2925	683	594	5.29	1054.3	1054.3	0

TABLE 2

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF DALLAS
FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

FLOODWAY DATA

UPPER PINE CREEK

Appendix F

Investigations and Analysis

Investigation and Analysis

A hydraulic model of Upper Pine Creek was put together utilizing cross section survey data. A computer program setup to compute the water depth for a given flow called WSP2 Computer Program, Technical Release No. 61, was used to compute rating curves for the various surveyed cross sections and bridges.

The drainage basin was divided into smaller subbasins to provide the appropriate flow figures at selected locations. The physical data for each basin such as soils, slope, type of land use, channel length, and rainfall were modeled into a computer program called (Computer Program for Project Formulation, Hydrology-SCSTR20). Four rainfalls were used in the model. The 10-year, 50-year, 100-year, and 500-year return frequencies were obtained from the U.S. Weather Bureau Technical Paper No. 40. The flows were compared to previous work done near the sewage treatment plant.

The floodflows were inserted into the water surface profile model producing the water surface elevation at each cross section and bridge. The discharges and elevations for each cross section are shown in appendix E. The cross section locations and flood boundaries are shown on photo maps in appendix A. The photomaps were made from aerial photo contact prints flown in 1979 by the Wisconsin Department of Transportation.

The water surface profiles are shown in appendix B.

Additional computer runs were made to determine the effects of managing the removable (stoplog) portion of the outlet structure. Two bays are removed if a rainfall event is observed to be of sufficient magnitude to cause a rise in the pond. This condition was run on the computer model and found to have slight to no effect on the flows of 10-year frequency, or greater. (Four inches of rainfall or greater.)

The next condition was with all stoplogs removed. In this situation the 10-year elevation of the pool was reduced by 0.3 feet (3-5/8 inches), the 50-year flood by 0.2 feet (2-3/8 inches), and the 100-year flood is reduced 0.1 feet (1-1/4 inches). The above results are insignificant because the dikes are overtopped by the 10-year frequency flood.

A final run was made with the structure removed and channels shaped and graded as follows:

The structure removed and channel graded to an even grade from a point opposite the overflow spillway on the west (Bass Creek) to a point below (downstream) the scour hole below the dam. The bottom width was assumed to be the same as the bridge opening under County Highway "A" or 120 feet.

The overflow spillway or weir on the west (start of Bass Creek) was removed to the configuration of the channel directly downstream of the spillway with no channel modification downstream. The resultant profiles are shown in appendix I.

This final alternative resulted in the greatest reduction in the flood profiles. The 100-year flood would be reduced to elevation 1050.7 (the normal pool elevation now) opposite the overflow spillway (weir) and to elevation 1049.7 at County Highway "A" bridge which puts it 1 foot below the normal pool elevation.

Appendix G

Glossary

GLOSSARY

CHAPTER NR. 116, WISCONSIN'S FLOOD PLAIN MANAGEMENT PROGRAM
NR. 116.03 DEFINITIONS

Channel. A channel is a natural or artificial watercourse with definite bed and banks to confine and conduct the normal flow of water.

Department. Department refers to the State of Wisconsin Department of Natural Resources.

Encroachment. An encroachment is any fill, structure, building, use, accessory use, or development in the floodway.

Encroachment/Floodway Lines. Encroachment/floodway lines are limits of obstruction to floodflows. These lines are on both sides of and generally parallel to the river or stream. The lines are established by assuming that the area landward (outside) of the encroachment/floodway lines will be ultimately developed in such a way that it will not be available to convey floodflows.

Equal Degree of Hydraulic Encroachment. The effect of any encroachment into the floodway must be computed by assuming an equal degree of hydraulic encroachment on the other side of a river or stream for a hydraulic reach. This computation assures that property owners up, down, or across the river or stream will have the same rights of hydraulic encroachment. Encroachments are analyzed on the basis of the effect upon hydraulic conveyance, not upon the distance the encroachment extends into the floodway. Also see: Hydraulic Reach.

Flood. A general and temporary condition of partial or complete inundation of normally dry land areas caused by the overflow or rise of rivers, streams, or lakes.

Flood Frequency. The term flood frequency is a means of expressing the probability of flood occurrences and is generally determined from statistical analyses. The frequency of a particular floodflow is usually expressed as occurring, on the average, once in a specified number of years. Any particular floodflow could, however, occur more frequently than once in any given year.

Flood Fringe. The flood fringe is that portion of the flood plain outside of the floodway, which is covered by floodwaters during the regional flood; it is generally associated with standing water rather than rapidly flowing water.

Flood Plain. The flood plain is the land which has been or may be hereafter covered by floodwater during the regional flood. The flood plain includes the floodway and the flood fringe.

Flood Plain Management. Flood plain management involves the full range of public policy and action for insuring wise use of flood plains. It includes everything from the collection and dissemination of flood control information to actual acquisition of flood plain lands; and the enactment and administration of codes, ordinances, and statutes for land use in the flood plain.

Flood Proofing. Flood proofing involves any combination of structural provisions, changes, or adjustments to properties and structures subject to flooding, primarily for the purpose of reducing or eliminating flood damage to properties, water and sanitary facilities, structures and contents of buildings in flood hazard areas.

Flood Protection Elevation. The flood protection elevation shall correspond to a point 2 feet of freeboard above the water surface profile associated with the regional flood and the official floodway lines. Also see: Freeboard.

Floodway. The floodway is the channel of a river or stream and those portions of the flood plain adjoining the channel required to carry and discharge the floodwater or floodflows associated with the regional flood.

Freeboard. Freeboard is a factor of safety usually expressed in terms of a certain amount of feet above a calculated flood level. Freeboard compensates for the many unknown factors that contribute to flood heights greater than the height calculated. These unknown factors include, but are not limited to, ice jams, debris accumulation, wave action, obstruction of bridge openings and floodways, the effects of urbanization on the hydrology of the watershed, loss of flood storage areas due to development and aggradation of the river or streambed.

High Flood Damage Potential. High flood damage potential is associated with any danger to life or health and any significant economic loss to a structure or building or its contents.

Hydraulic Floodway Lines. Hydraulic floodway lines shall delineate the channel of the river or stream and those portions of the adjoining flood plains which are reasonably required to carry and discharge the regional floodflow without any measurable increase in flood heights.

Hydraulic Reach. A hydraulic reach along a river or stream is that portion of the river or stream extending from one significant change in the hydraulic character of the river or stream to the next significant change. These changes are usually associated with breaks in the slope of the water surface profile, and may be caused by bridges, dams, expansion and contraction of the waterflow, and changes in streambed slope or vegetation.

Levee. A levee is a continuous dike or embankment of earth constructed parallel to a river or stream to prevent flooding of certain areas of land.

Official Floodway Lines. Official floodway lines are those lines which have been adopted by the county, city, or village, approved by the department, and which are shown on the official flood plain zoning maps and used for regulatory purposes.

Regional Flood. The regional flood is a flood determined to be representative of large floods known to have generally occurred in Wisconsin and which may be expected to occur on a particular stream because of like physical characteristics. The regional flood is based upon a statistical analysis of streamflow records available for the watershed and/or an analysis of rainfall and runoff characteristics in the general watershed region. The flood frequency of the regional flood is once in every 100 years; this means that in any given year there is a 1 percent chance that the regional flood may occur. During a typical 30-year mortgage period, the regional flood has a 26 percent chance of occurring.

Structure. A structure is any manmade object with form, shape, and utility, either permanently or temporarily attached to or placed upon the ground, riverbed, streambed, or lakebed.

Watershed. A watershed is a region or area contributing ultimately to the water supply of a particular watercourse or body of water.

Water Surface Profile. The water surface profile is a graphical representation of the height of the water surface throughout a county, city, or village based upon a certain flow passing through the river or stream. A water surface profile based upon flows occurring during a regional flood is used in regulating the flood plain areas.

Appendix H

Bibliography

Bibliography and Related References

1. Conger, Duane H., Estimating Magnitude and Frequency of Floods in Wisconsin, U.S. Department of the Interior, Geological Survey, Water Resources Division, Madison, Wisconsin, 1971.

2. State of Wisconsin, Blue Book, Wisconsin Legislative Reference Bureau, 1981.

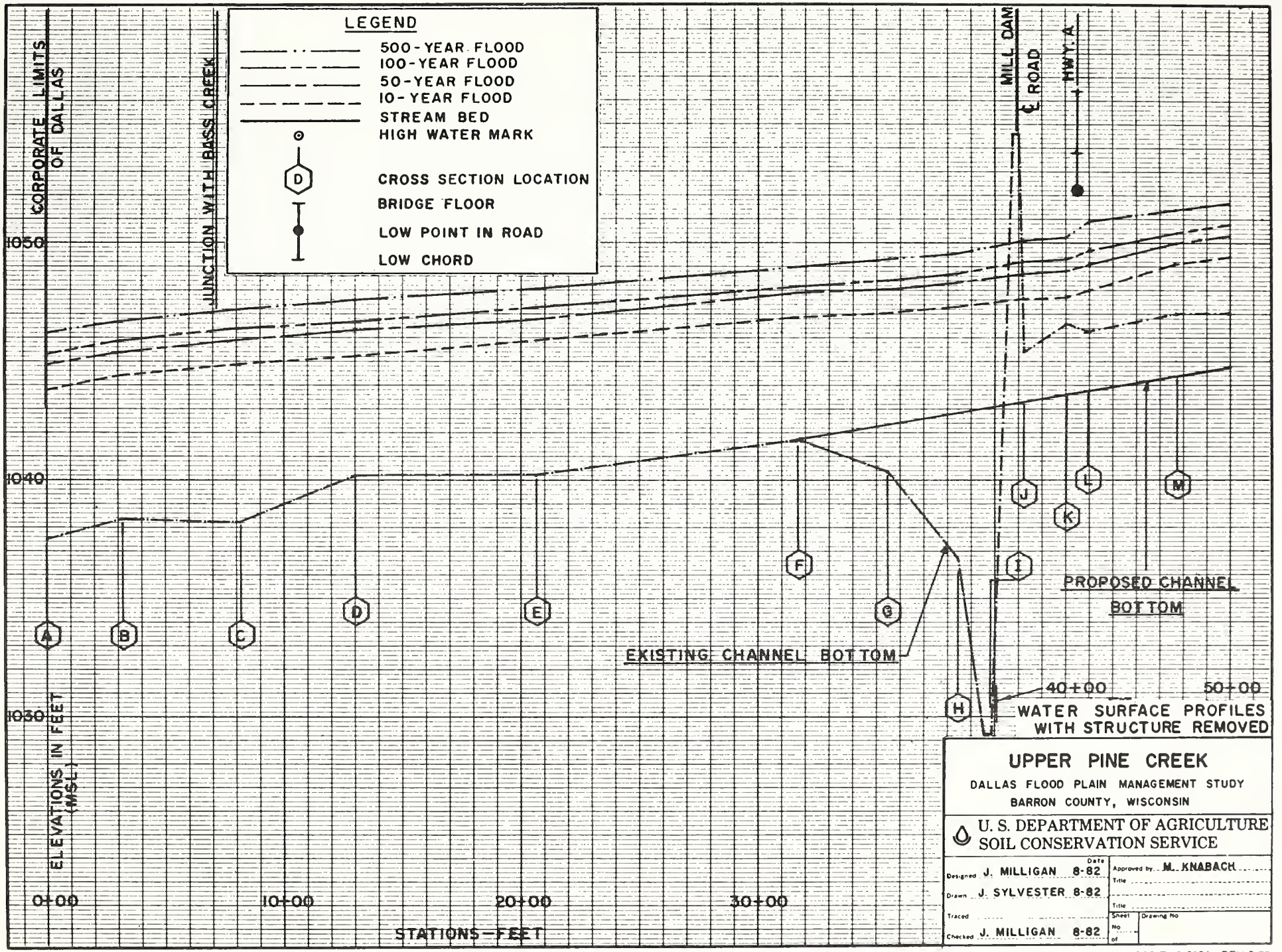
3. USDA, Soil Conservation Service, Computer Program for Project Formulation Hydrology Technical Release No. 20, Washington, D.C., May 1965.

4. USDA, Soil Conservation Service, WSP-2 Computer Program, Technical Release No. 61, May 1976.

5. Shaw & Fredine, 1956. Wetlands of the United States. United States Department of Interior, Fish and Wildlife Service, Circular 39, 67 pages.

Appendix I

Profile with Structure Removed



I-1

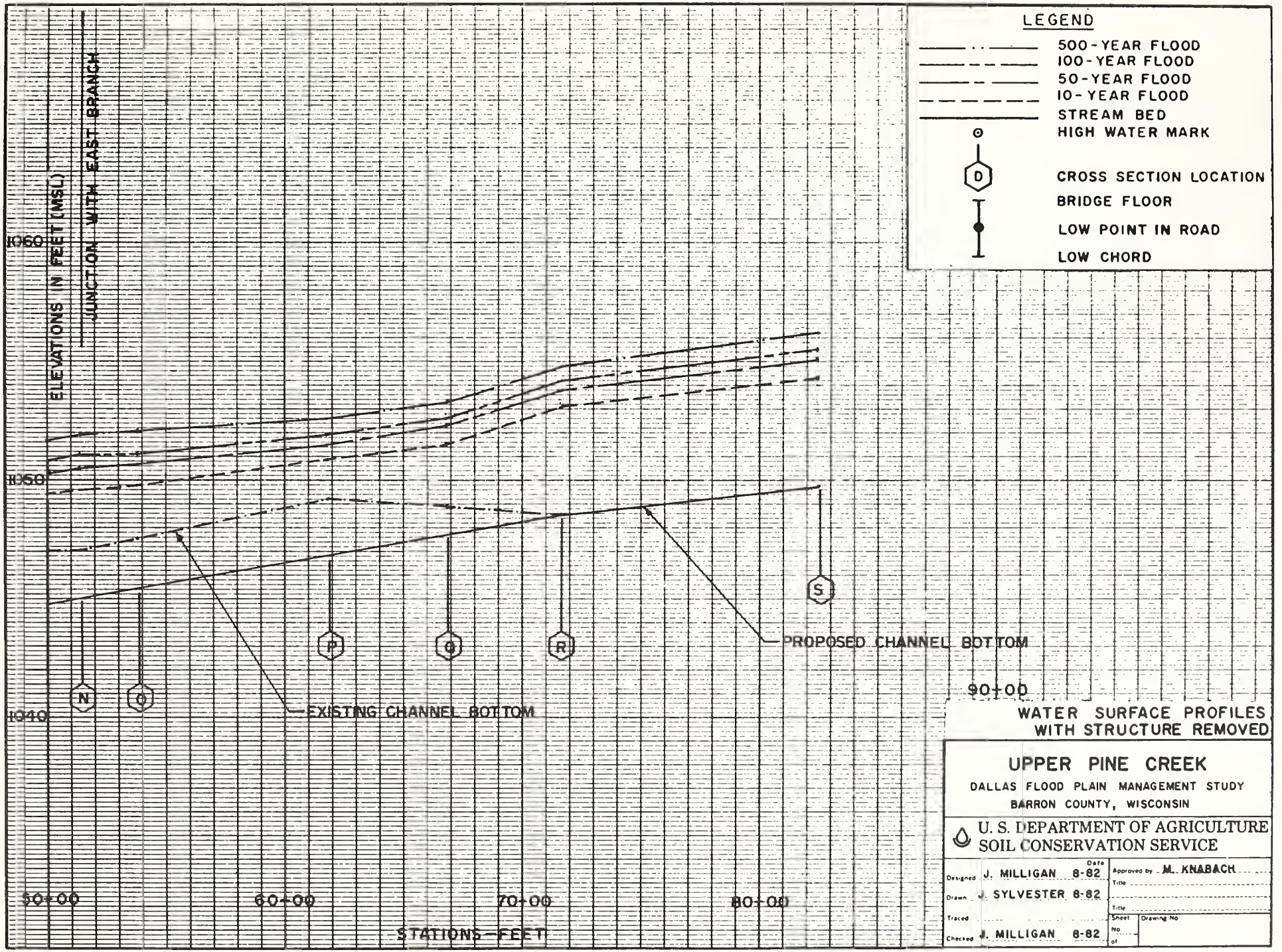
UPPER PINE CREEK

DALLAS FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed J. MILLIGAN	Date 8-82	Approved by M. KNABACH	
Drawn J. SYLVESTER	8-82	Title	
Traced		Title	
Checked J. MILLIGAN	8-82	Sheet No. of	Drawing No.

SCS-ENG-313A REV 8-75



WATER SURFACE PROFILES
WITH STRUCTURE REMOVED

UPPER PINE CREEK

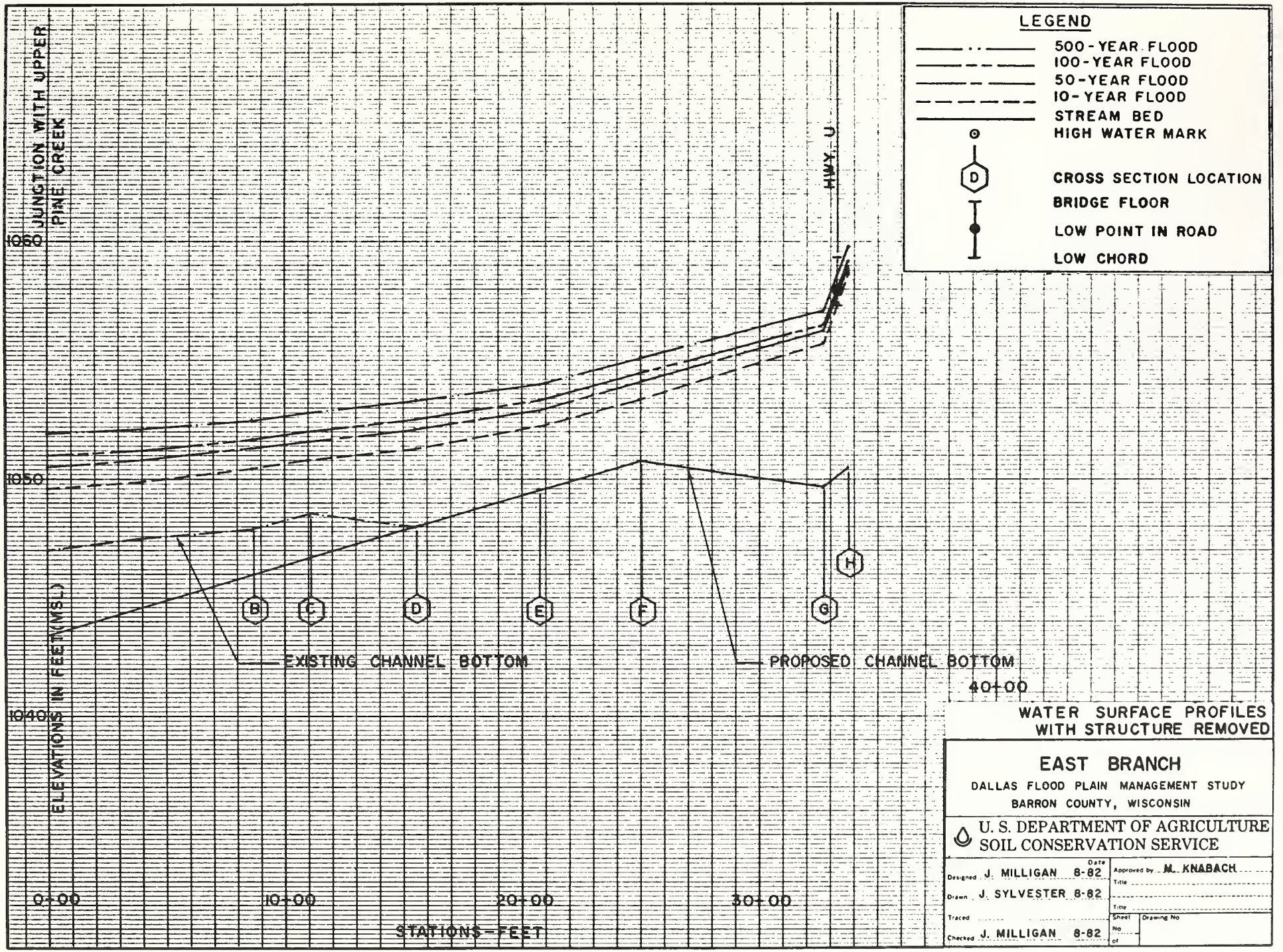
DALLAS FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

		Date		
Designed	J. MILLIGAN	8-82	Approved by	M. KNABACH
Drawn	J. SYLVESTER	8-82	Title	
Traced			Title	
Checked	J. MILLIGAN	8-82	Sheet No. of	Drawing No.

SCS-ENG-313A REV 8-75

I-2



WATER SURFACE PROFILES
WITH STRUCTURE REMOVED

EAST BRANCH

DALLAS FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed J. MILLIGAN	Date 8-82	Approved by M. KNABACH	
Drawn J. SYLVESTER	8-82	Title	
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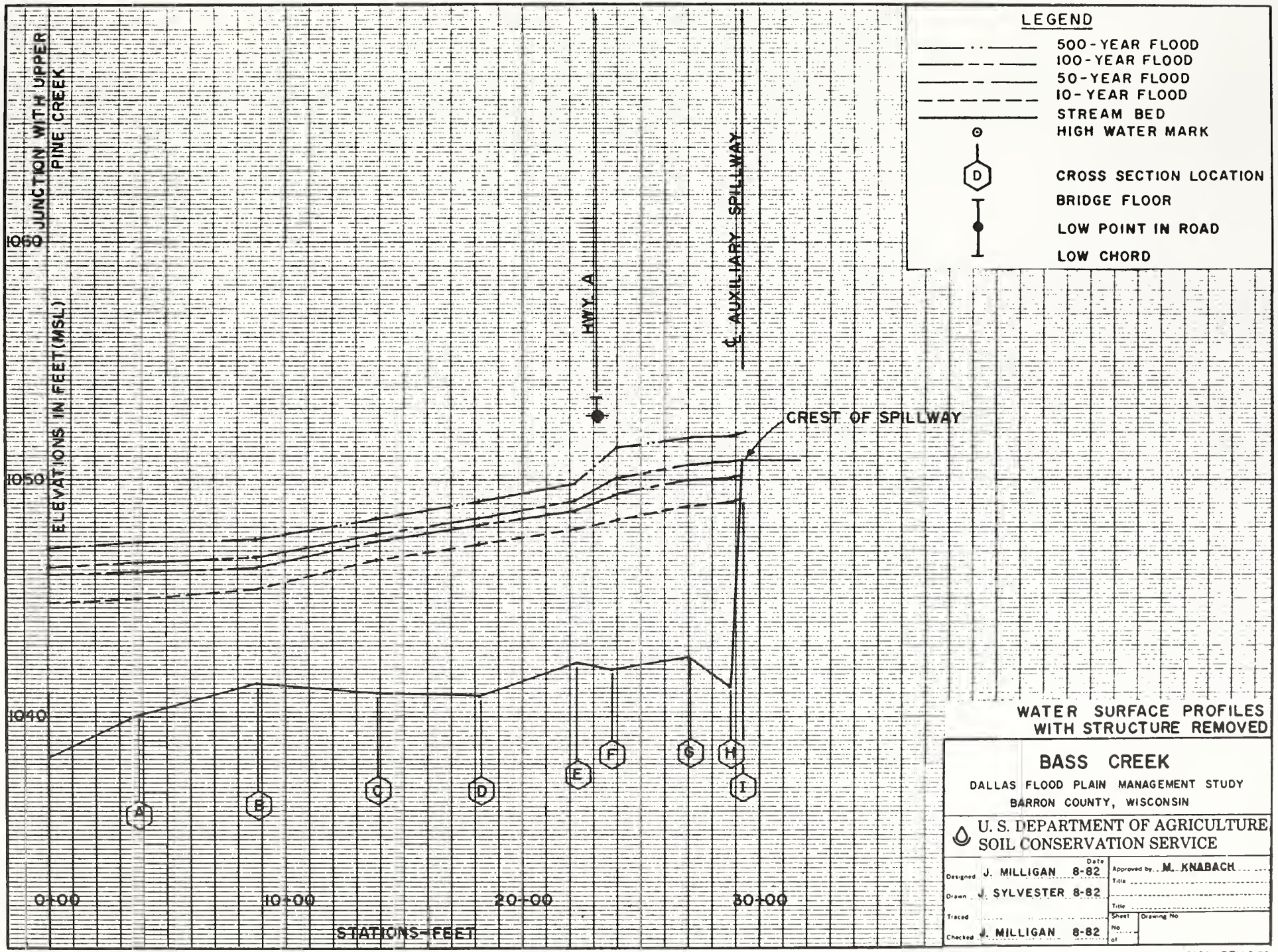
Checked J. MILLIGAN	8-82	Sheet No. of	Drawing No.

SCS-ENG-313A REV 8-75



WATER SURFACE PROFILES
WITH STRUCTURE REMOVED

BASS CREEK

DALLAS FLOOD PLAIN MANAGEMENT STUDY
BARRON COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

		Date		
Designed	J. MILLIGAN	8-82	Approved by	M. KNABACH
Drawn	J. SYLVESTER	8-82	Title	
Traced			Title	
Checked	J. MILLIGAN	8-82	Sheet No. of	Drawing No.

SCS-ENG-313A REV 8-75